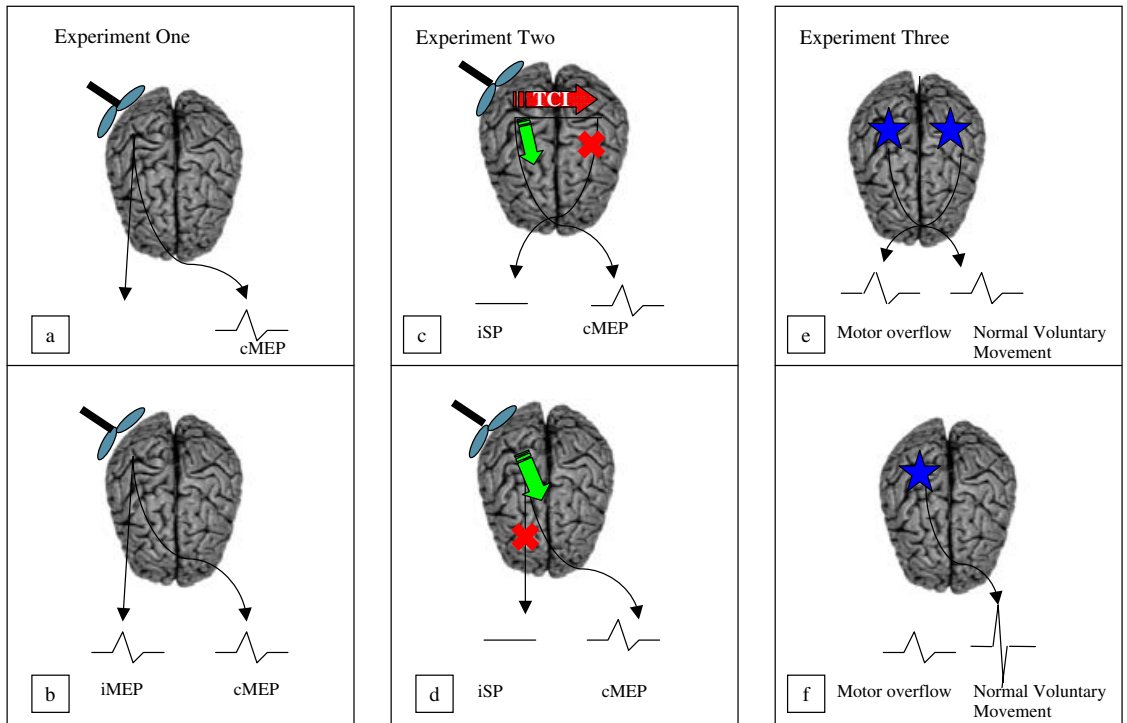


APPENDIX FIG. 1. Theories of Motor Overflow Production.

a) The Ipsilateral Activation Theory (IAT) production theory proposes the presence of functionally active ipsilateral corticospinal projections (a), where movements produced by the contralateral hemisphere result in a degree of ipsilateral movement. b) The Bilateral Activation Theory (BAT) suggests that during voluntary movement disruption to transcallosal processes, TCI and TCF, results in bilateral activation of corticospinal tracts – thus resulting in a degree of overflow.



APPENDIX FIG. 2. TMS Experimental Protocols.

The first panel depicts the potential findings from experiment one; a) following unilateral TMS stimulation a contralateral MEP is obtained indicating the absence of an active ipsilateral corticospinal tract, alternatively b) following unilateral TMS stimulation bilateral MEPs are obtained indicating an active ipsilateral corticospinal tract. The middle panel indicates the possible findings from the second experiment; c) a significant difference in the latency between the iSP and the facilitated cMEP would suggest bilateral activation was responsible for overflow, while d) the iSP and facilitated cMEP occurring at essentially the same time would suggest an ipsilateral origin of motor overflow. The final panel shows the alternative findings from experiment three; e) if TMS to the hemisphere contralateral to overflow production is able to facilitate the resultant MEP to the same degree as TMS to the hemisphere contralateral to voluntary movement bilateral activation is supported, however f) if the MEP induced during motor overflow is not facilitated to the same degree as that induced during voluntary movement then bilateral activation is not supported.